UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,895	04/13/2004	Michael A. Rothman	P19009	5656

46915   7590   12/26/2007
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ART UNIT	PAPER NUMBER
2185	

MAIL DATE	DELIVERY MODE
12/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No.	Applicant(s)
	10/823,895	ROTHMAN ET AL.
	Examiner	Art Unit	
	Jae U. Yu	2185	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _06 August 2007_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-31_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-31_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

The examiner acknowledges the applicant's submission of the amendment dated 8/6/2007. At this point claims 1, 3, 10, 12, 19, 20, 23 and 25 have been amended and claims 1-31 are pending in the instant application.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23-31 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 23 recites "an article of manufacture in communication with storage", which the specification defines as "a transmission media, such as a network transmission line...infrared signals, etc" in paragraph 19. The transmission media is intangible and the claims are non-statutory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1.   <u>Claims 1-2, 7-9, 10-11, 16-18, 19, 21, 23-24 and 29-31</u> are rejected under 35

U.S.C. 102(b) as being anticipated by Lawrence et al. (US 6,253,300) and its

incorporated reference Ruff et al. (5, 706, 472).

2.   **<u>Independent claims 1, 10, 19 and 23</u>** discloses, "circuitry, a storage controller

and an article of manufacture that are enabled to" perform the following method.

Lawrence et al. disclose the following method that is executed in a computer

system. Therefore, the computer system inherently includes the "circuitry, a

storage controller and an article of manufacture" from the claim.

"Receiving an I/O request to write **["move data" 194, Figure 9, Ruff et al.]** un update

to an object **["File", Column 5, Lines 37-39]** in storage **["Storage Medium", Column**

5, Line 42]"

"Defragmenting the object in storage **[Defragmenting the file in storage, Column 5,**

Lines 37-39] so that blocks in storage including the object are contiguously **["Stored in**

contiguous region of the storage medium", Column 5, Lines 41-42] in response to

receiving the I/O request to write the update to the object, wherein the request to write

the update to the object causes the defragmentation operation **[Running a**

defragmentation program before the copy operation, Column 5, Lines 37-39]"

"Executing the I/O request to write update to the object in storage **[Copying the files in
storage, Column 5, Lines 37-39]**"

3. **Claims 2, 11 and 24** disclose, "the I/O request is executed with respect to the
object after defragmenting the object". **Lawrence et al. disclose copying file ("I/O
request to the object" from the claim) after running a defragmentation program in
column 5, Lines 37-39.**

4. **Claims 7, 16 and 29** disclose, "determining whether the object is read-only,
wherein the object is defragmented if the object is not read-only, wherein the I/O
request to update the object is executed without defragmenting the object in response
to determining that the object is read-only". **Read-only means that the object is write-
protected. Since defragmenting comprises the process of copying/deleting of an
object to a different location, Lawrence et al. inherently defragment only "not
write-protected" ("not read-only" from the claim) objects.**

5. **Claims 8-9, 17-18 and 30-31** disclose, "the operation of receiving the I/O
requests, initiating the operation to defragment the object, and executing the I/O request
of defragmenting the object in storage are performed by a storage controller managing
I/O requests to the storage and a device driver for the storage providing an interface to
the storage". **Lawrence et al. disclose the operation of defragmenting the object in**

storage in a computer system. Therefore, the computer system inherently

includes the "storage controller" and the "device driver" from the claim.

6.   **Claim 21** discloses, "the storage controller and storage device are included in the

same housing **[Computer System]**". Lawrence et al. **disclose defragmenting in a**

computer system that inherently includes the "storage controller" and the

"storage device" from the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1.   Claims 3, 12, 20 and 25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lawrence et al. (US 6,253,300) and Ruff et al. (5, 706, 472) in view

of Brown, III et al. (US 6,038,636).

2.   As per **claims 3, 12, 20 and 25**, Lawrence et al. disclose, "determining whether

an amount of fragmentation of the object in the storage exceeds a fragmentation

threshold **[Any amount of fragmentation higher than zero, Column 5, Lines 37-39]**

in response to receiving the I/O request, wherein the object is defragmented

[Eliminating fragmentation on the file, Column 5, Lines 37-39] if the amount of

fragmentation exceeds the fragmentation threshold **[If fragmentation exists, Column 5, Lines 37-39]**, and wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the amount of fragmentation does not exceed the fragmentation threshold".

Lawrence et al. do no disclose expressly, "indicating an acceptable number of bytes stored in non-contiguous locations".

Brown, III et al. disclose, "determining whether the size field in the file header is equal to a certain predetermined code" (Column 10, Lines 1-5), wherein the size is represented as "bytes" (Column 7, Lines 45-46).

Lawrence et al. and Brown, III et al. are analogous art because they are from the same filed of endeavor of defragmenting storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Lawrence et al. by defragmenting upon determining the size of the non-contiguous data sectors as taught by Brown, III et al. in column 10, at lines 1-5.

The motivation for doing so would have been to reclaim free spaces in memory device as expressly taught by Brown, III et al. in the abstract.

Therefore, it would have been obvious to combine Brown, III et al. with Lawrence et al. for the benefit of memory optimization to obtain the invention as specified in claims 3, 12, 20 and 25.

3.   Claim 22 is rejected under 35 U.S.C. 103 (a) as being obvious over Lawrence et

al. (US 6,253,300) and Ruff et al. (5, 706, 472) in view of Karger et al. (US 5,339,449).

4.   As per **claim 22**, Lawrence et al. disclose, "a processor **[Computer System]**".

Lawrence et al. do not disclose expressly, "a memory enabled to store the I/O

request before the I/O request is received by the storage controller".

Karger et al. disclose the I/O request queue in column 20, at lines 47-50.

Lawrence et al. and Karger et al. are analogous art because they are from the

same field of endeavor of memory management.

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to modify Lawrence et al. by including an I/O request queue as taught by

Karger et al. in column 20, at lines 47-50.

The motivation for doing so would have been to process the I/O requests based

on their priorities in the queue as expressly taught by Karger et al. in column 20-21, at

Lines 67-5.

Therefore, it would have been obvious to combine Karger et al. with Lawrence et

al. for the benefit of prioritized I/O process to obtain the invention as specified in claim

22.

5.   <u>Claims 4-5, 13-14 and 26-27</u> are rejected under 35 U.S.C. (a) as being obvious over Lawrence et al. (US 6,253,300) and Ruff et al. (5, 706, 472) in view of Douglis et al. (US 2005/0108075).

6.   As per **claims 4-5, 13-14 and 26-27**, Lawrence et al. disclose, "performing defragmentation in response to receiving the I/O request".

Lawrence et al. do not disclose expressly, "determining whether a user settable flag indicates to perform defragmentation, wherein the object is defragmented if the flag indicates to perform defragmentation" and "executing the I/O request without performing defragmentation if the flag does not indicate to perform defragmentation".

Douglis et al. disclose deferring defragmentation if there is restriction of power usage ("flag" from the claim) in paragraph 32, wherein the "flag" is user settable since an user can alternate between restricted power source (battery) and unlimited power source (wall outlet).

Lawrence et al. and Douglis et al. are analogous art because they are from the same filed of endeavor of defragmentation.

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to modify Lawrence et al. by including a flag that defers defragmentation

in case of battery use as taught by Douglis et al. in paragraph 32.

The motivation for doing so would have been adaptive control of application

power consumption in a mobile computer as expressly taught by Douglis et al. in

paragraph 2.

Therefore, it would have been obvious to combine Douglis et al. with Lawrence et

al. for the benefit of efficient power consumption to obtain the invention as specified in

claims 4-5, 13-14 and 26-27.

7.   Claims 6, 15 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Lawrence et al. (US 6,253,300) and Ruff et al. (5, 706, 472) in view of Ball et al.

(US 2005/0162944).

8.   As per **claims 6, 15 and 28,** Lawrence et al. disclose the method and the system

recited in claims 1, 10 and 23 including the limitation, "the I/O request to update object

is executed" and "the object is defragmented if the object is within one logical partition

[the object within "a disk" being defragmented, Figure 7]".

Lawrence et al. do not disclose expressly not defragmenting the object in

response to determining that the object is included in more than one logical partition.

Ball et al. disclose the object (Element 24) included in more than one logical partition (partitions a-d), wherein the active memory is not defragmented (Abstract).

Lawrence et al. and Ball et al. are analogous art because they are from the same filed of endeavor of defragmenting storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Lawrence et al. by not defragmenting the active memory and defragmenting the redundant inactive memory instead as taught by Ball et al. in the abstract.

The motivation for doing so would have been to minimize the impact of defragmentation, thus, increasing the system performance as expressly taught by Ball et al. in paragraph 24.

Therefore, it would have been obvious to combine Ball et al. with Lawrence et al. for the benefit of mitigating the impact of defragmentation to obtain the invention as specified in claims 6, 15 and 28.

Arguments Concerning Prior Art Rejections

1st Point of Argument

Regarding claims 1, 10, 19 and 23, the applicant argues that Lawrence fails to teach the amended claim limitation, "write the update to object" (emphasis added).

However, Ruff, the reference incorporated in Lawrence (Column 2, Lines 10-13),

teaches such limitation (See the corresponding claim rejection above).

2nd Point of Argument

Regarding claims 3, 12, 20 and 25, the applicant argues Lawrence fails to teach

the amended claim limitation. The examiner directs the applicant's attention to the

corresponding claim rejection above.

3rd Point of Argument

Regarding claims 8-9, 17-18 and 30-31, the applicant argues that Lawrence does

not teach the claim limitation, "the operation of defragmenting the object in storage is

performed by a device driver for the storage providing an interface to the storage" and

"performed by a storage controller managing I/O requests to the storage". However,

Lawrence clearly discloses the "operation of defragmenting the object in storage" (See

the corresponding claim rejections above), which is a form of the "interface to the

storage" and "I/O requests". Since Lawrence does perform the same operations that

are executed by the "device driver" and the "storage controller", Lawrence inherently

includes the "device driver" and the "storage controller".

4th Point of Argument

Regarding claims 4, 13 and 26, the applicant argues that Douglis fails to teach the "user settable flag". However, Douglis clearly teaches determining if the power source is limited, wherein the examiner interprets such action as determining a "flag", and it is "user settable" because an user an alternate between restricted power source (battery) and unlimited power source (wall outlet).

5th Point of Argument

Regarding claims 6, 15 and 28, the applicant argues that Ball fails to teach not defragmenting the object in response to determining that the object is included in more than one logical partition. However, Ball expressly teaches the "element 24" in the figures being stored in partitions a-d, wherein the active memory is not defragmented (abstract).

Conclusion

A.   Claims Rejected in the Application

Per the instant office action, claims 1-31 have received a second action on the merits and are subject of a second action non-final.

B.   Direction of All Future Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae Un Yu who is normally available from 9:00 A.M. to

5:30 P.M. Monday thru Friday and can be reached at the following telephone number:
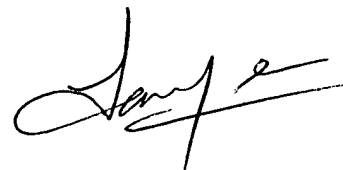
(571) 272-1133.

If attempts to reach the above noted examiner by telephone are unsuccessful,

the Examiner's supervisor, Sanjiv Shah, can be reached at the following telephone

number: (571) 272-4098.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

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Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12/10/2007

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